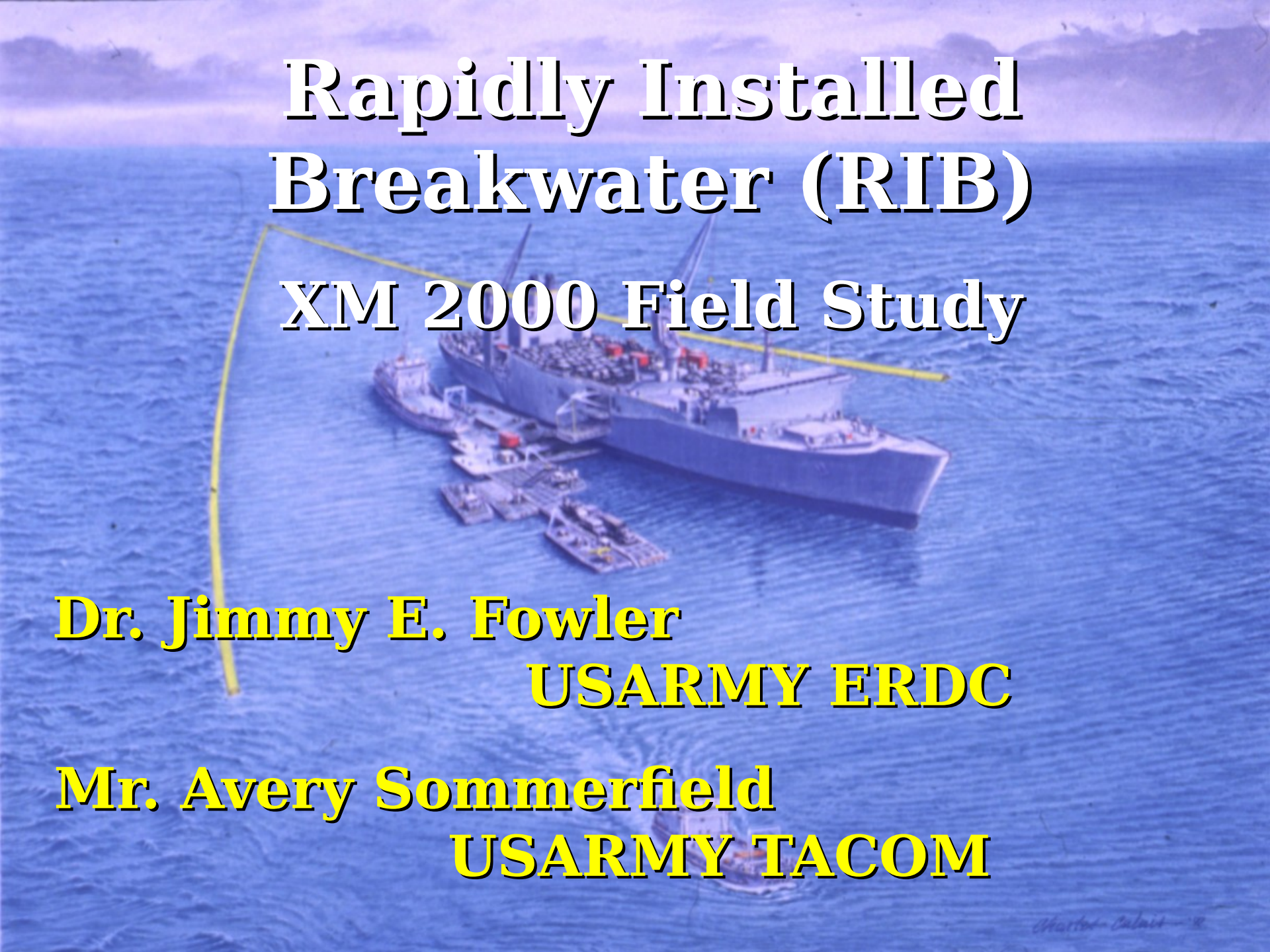
Rapidly Installed Breakwater (RIB)

XM 2000 Field Study



Dr. Jimmy E. Fowler
USARMY ERDC

Mr. Avery Sommerfield
USARMY TACOM

OUTLINE

- RIBS UPDATE
  - QUICK HISTORY
  - ATD STATUS
  - FY 01
  - FY 02
- DEPLOYMENT/EMPLOYMENT
- ACQUISITION STRATEGY

Approved by ASTWG, AUG 98

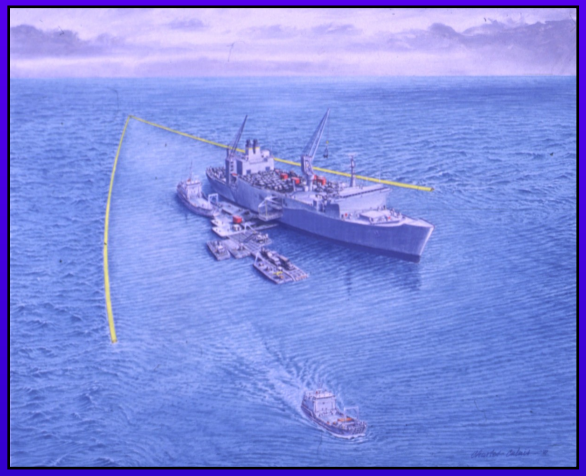
Approved by WTC, June 2000

Enhanced Coastal Trafficability And Sea State Mitigation

DTO MP.28.01

Advanced Technology Demonstration

START DATE: FY99



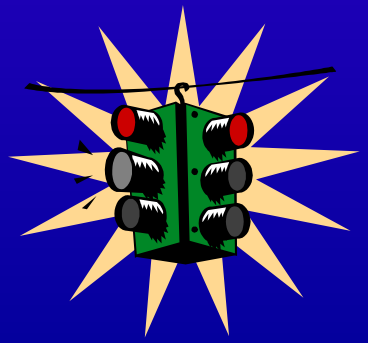
Dr. Don Resio
USAE Research & Development Center
Waterways Experiment Station
Telephone: (601)634-2018
E-mail: d.resio@cerc.wes.army.mil

RIB MAJOR ATD OBJECTIVE

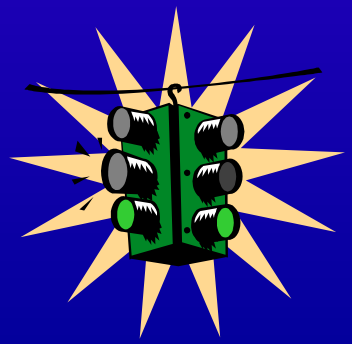
Successfully demonstrate a rapidly installed RIB System at ocean (full) scale with wave height reduction of 50% or more .....

Why 50%????

SS3



SS2



MILITARY OPERATIONAL REQUIREMENTS - RIB

- RAPID EMPLOYMENT
- ARRIVE WITH HLPS
- SS3 REDUCED TO SS2
  - for wave periods up to 6 seconds
- SS5 SURVIVABLE
- SS3 EMPLOYMENT CAPABILITY

RIBS ATD Exit Criteria

Exit Criteria – Enhanced Coastal Trafficability and Sea State M		
Part I: Rapidly Installed Breakwater System (RIBS)		
Description	**Threshold**	**Goal**
Setup and Employment of RIBS after Arrival Onsite	48 Hours	24 Hours
Demonstrated RIBS Performance in Wave Height Reduction	50%	65%
Survivability of RIBS in Storms	Sea State 5	Sea State 6
Transportable and Employable Using Existing Assets	N/A	N/A
Part II: Cross-Beach		
Description	**Threshold**	**Goal**
Demonstrated Improvement in Construction Time over Existing Systems	30%	50%
Demonstrated Performance in Terms of Throughput and Maintenance Relative to Sand Grid Roadways	Equal	20% Better
Transportable and Employable Using Existing Assets	N/A	N/A

ATD MILESTONES

1999 Structural Requirements for RIBS

2000 Mooring Requirements for RIBS

2000 Engineering Design for Prototype RIBS

2001 Fabricate 1st Prototype ATD-RIBS Segments

2001 Field Deploy 1st Prototype ATD-RIBS Segments

2001 Plan and Materials for Beach Stabilization

2002 Incorporate Lessons Learned in Final Design

2002 Fabricate Final Prototype ATD-RIBS

2002 Deploy Final Prototype ATD-RIBS w/ planned exercise

2002 Demonstrate Beach Stabilization w/ planned exercise

TECHNICAL CHALLENGES

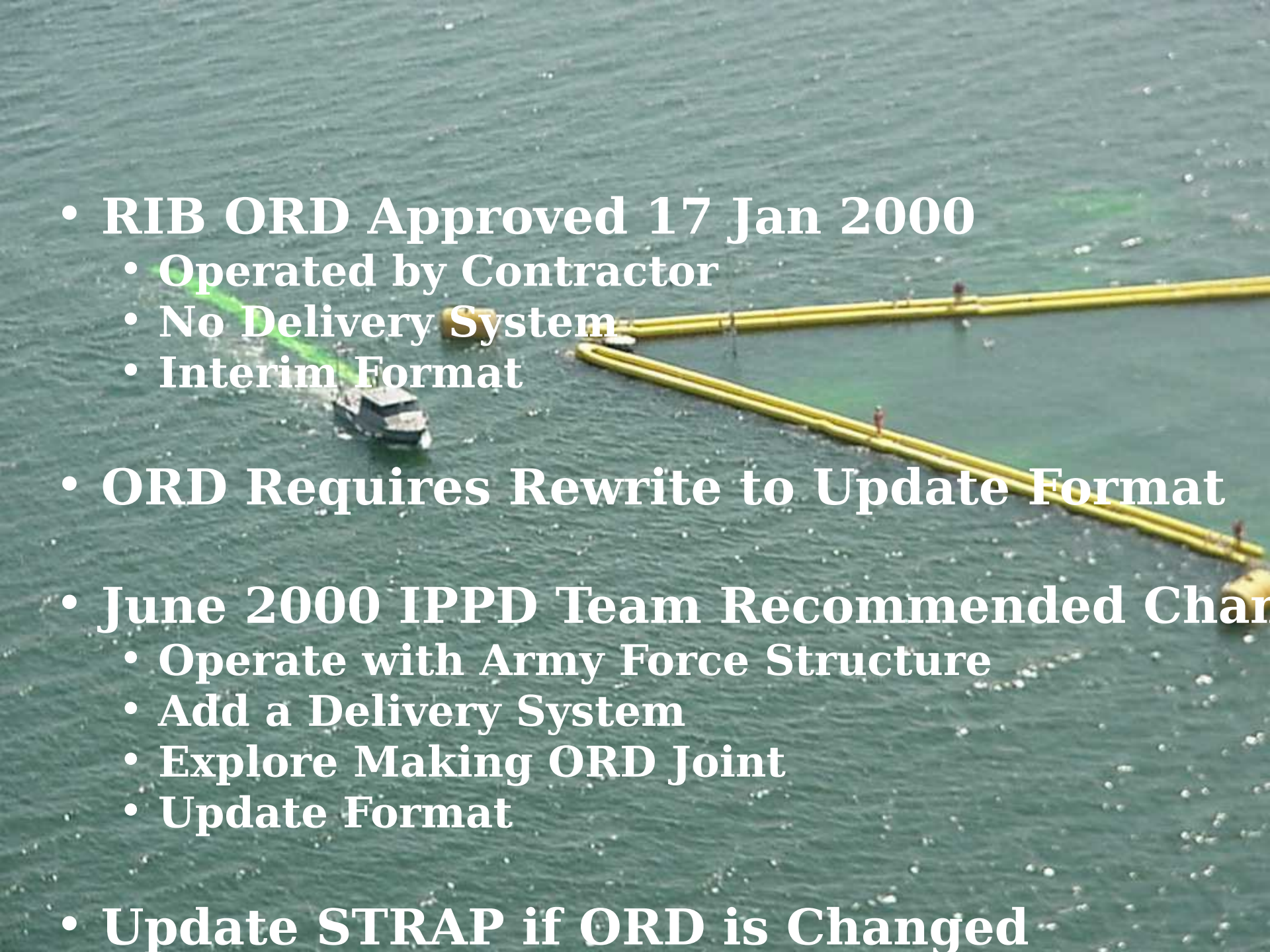
- FATIGUE/SURVIVABILITY
- JOINTS BETWEEN SEGMENTS
- MOORING
- RAPID EMPLOYMENT
- GROUND SWELL

RIBS Integrated Concept Team

- TACOM
- TARDEC
- HQ, USACE
- USAE Coastal Hydraulic Lab
- USA Transportation School
- USA Engineer School/MSBL
- Joint Staff
- HQ, TRADOC, CSS Directorate
- OPNAV
- 74th EN Dive Team
- ODCSLOG
- ODCSOPS
- CASCOM
- Force Projection Battl
  Support Element
- NSWC, Carderock Div
- 7th Transportation Gro
- OPTEC

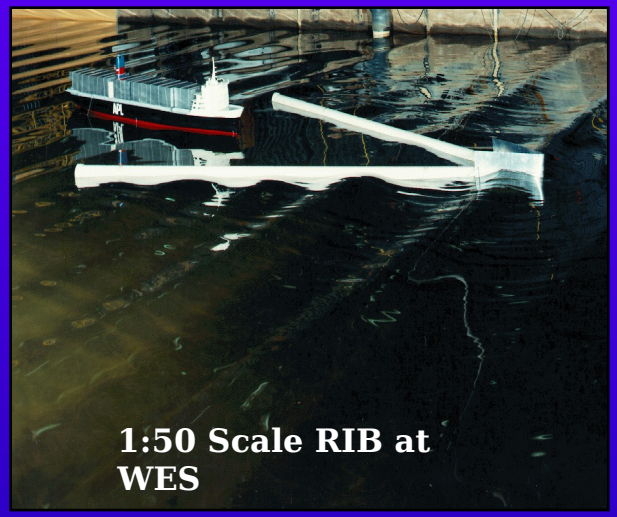
Combat Developer
TRADOC/CASCOM

Materiel Developer
TACOM

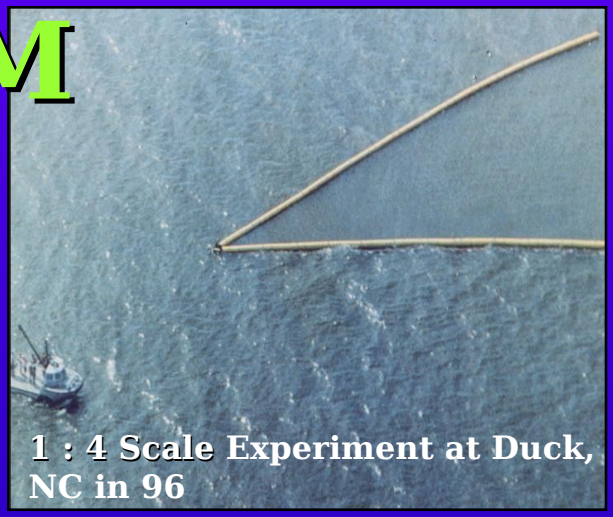


- **RIB ORD Approved 17 Jan 2000**
  - **Operated by Contractor**
  - **No Delivery System**
  - **Interim Format**
- **ORD Requires Rewrite to Update Format**
- **June 2000 IPPD Team Recommended Chan**
  - **Operate with Army Force Structure**
  - **Add a Delivery System**
  - **Explore Making ORD Joint**
  - **Update Format**
- **Update STRAP if ORD is Changed**

CONDENSED HISTORY OF RIB PROGRAM


1:50 Scale RIB at WES

1:36 Scale OSU RIB


1 : 4 Scale Experiment at Duck, NC in 96

Rigid RIB in 97

Hydro-RIB in 97

APPROVAL AS ARMY ATD (FY99 - 2002)

FPBLSE
MSBL
} CO-SPONSORS

CONDENSED HISTORY OF RIB PROGRAM (CONT)

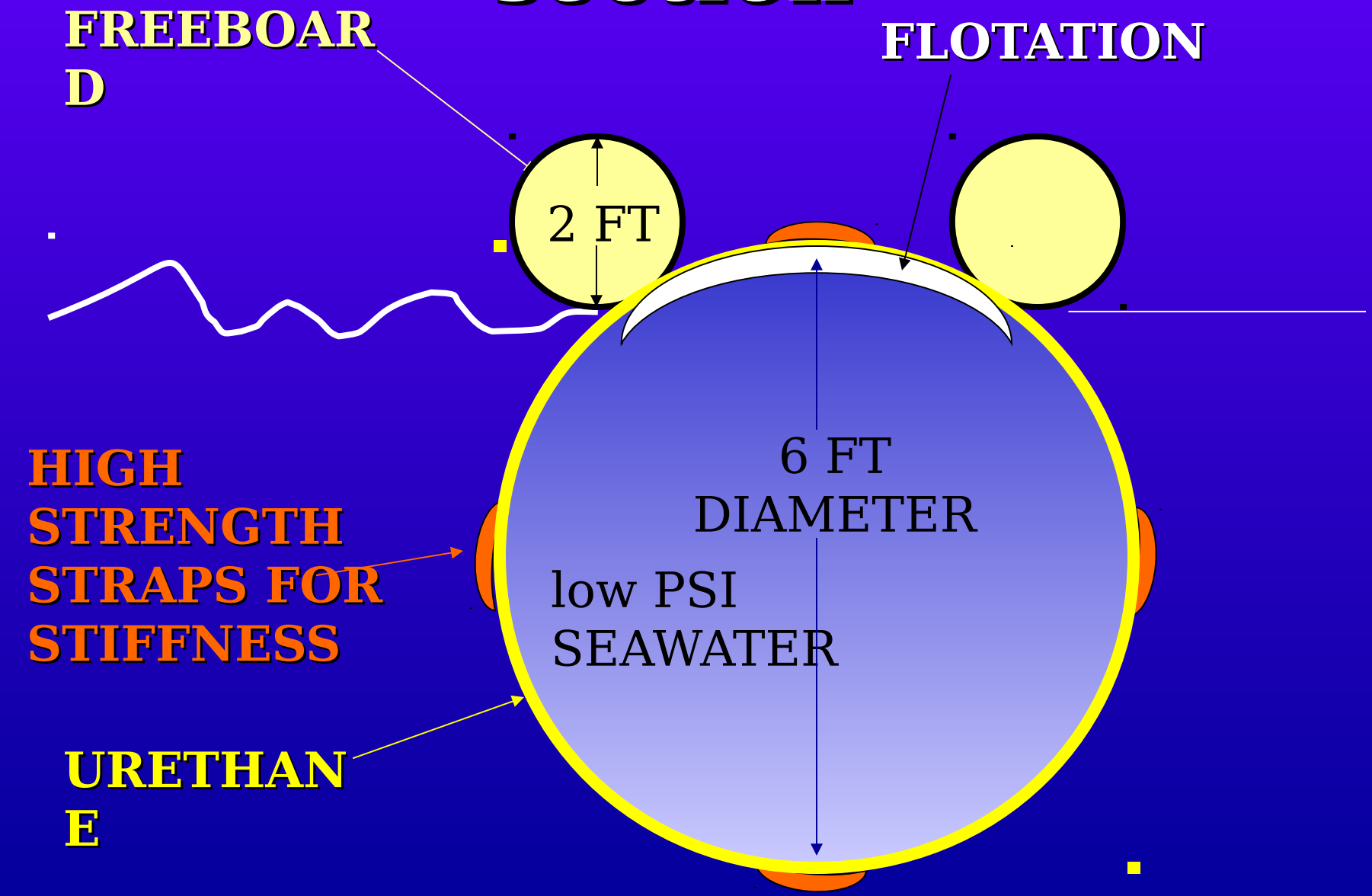
XM-99
RIB

FY 2000 FIELD STUDY
PENSACOLA, FLORIDA

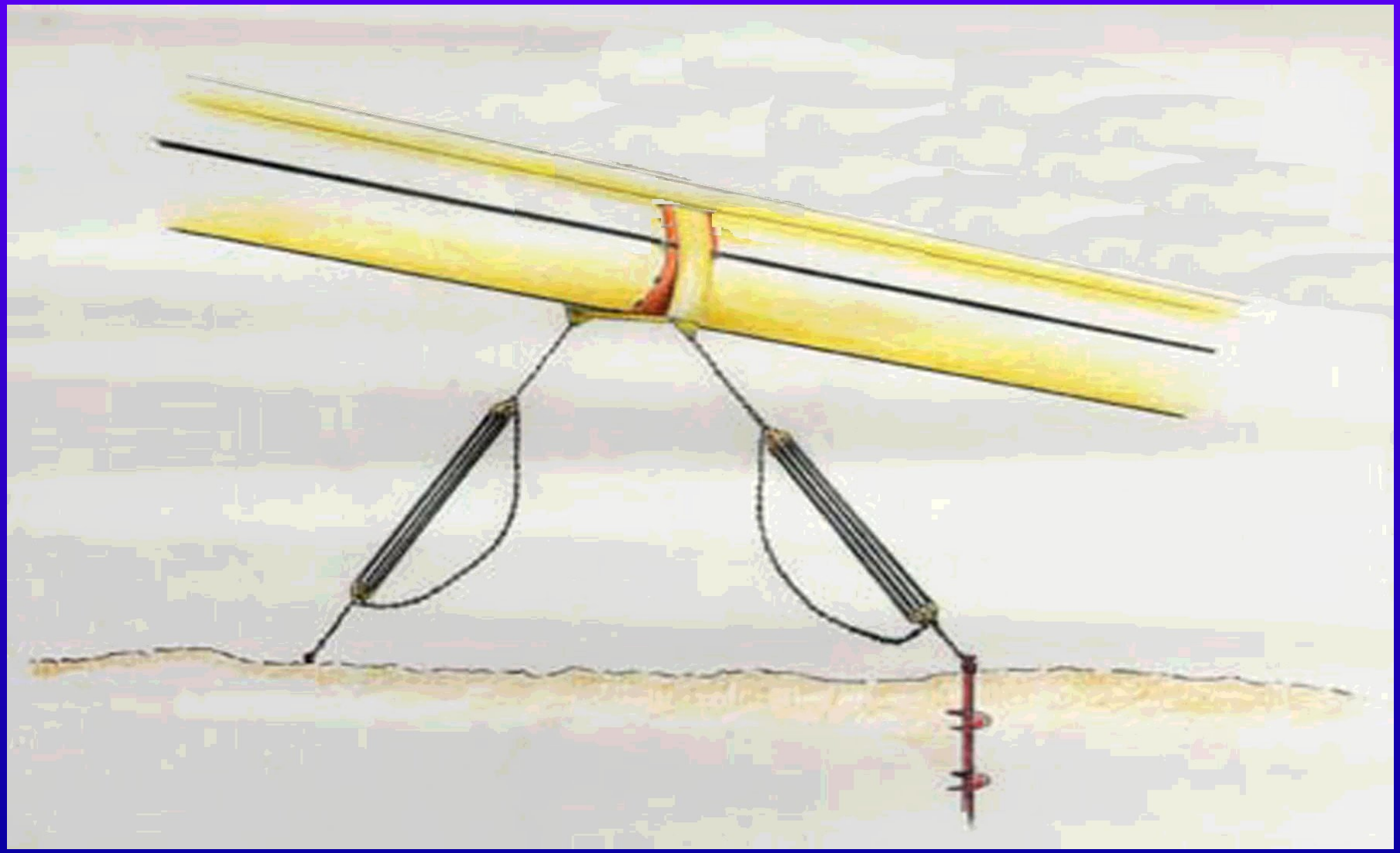
FOCUS OF EFFORTS

IMPROVED "CONTINUOUS" JOINT
MOORING SYSTEM
DEPLOYMENT OPTIONS
OPERATIONAL CONFIGURATIONS

RIBS XM 2000 cross section



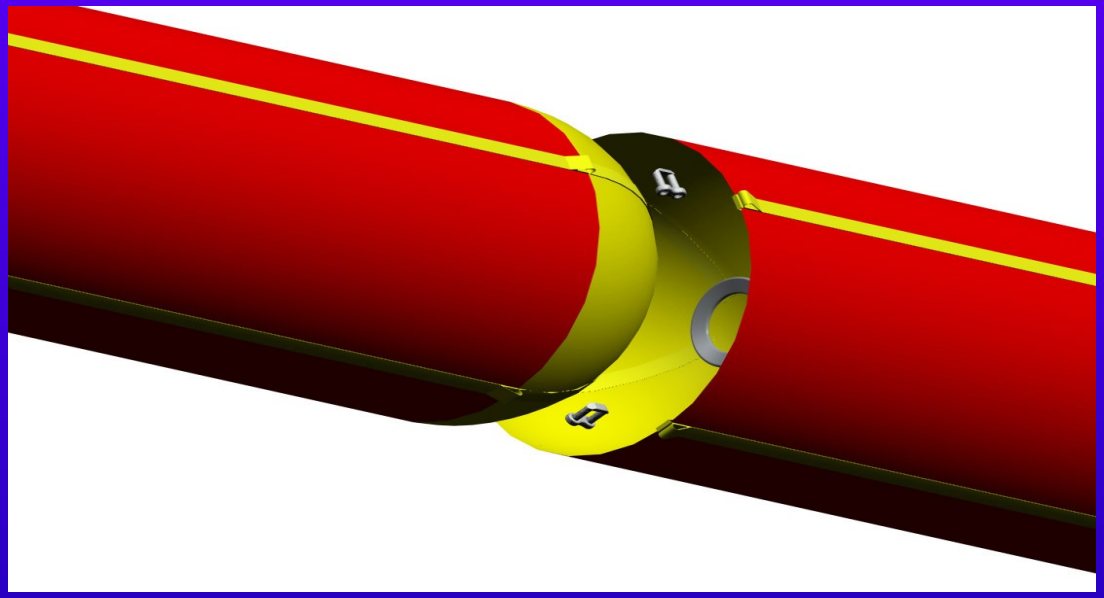
XM-2000



OPTION 1

OPTION 2

Improved Joint Design



5 WEEKS IN THE WATER

FY 00 Mooring Studies

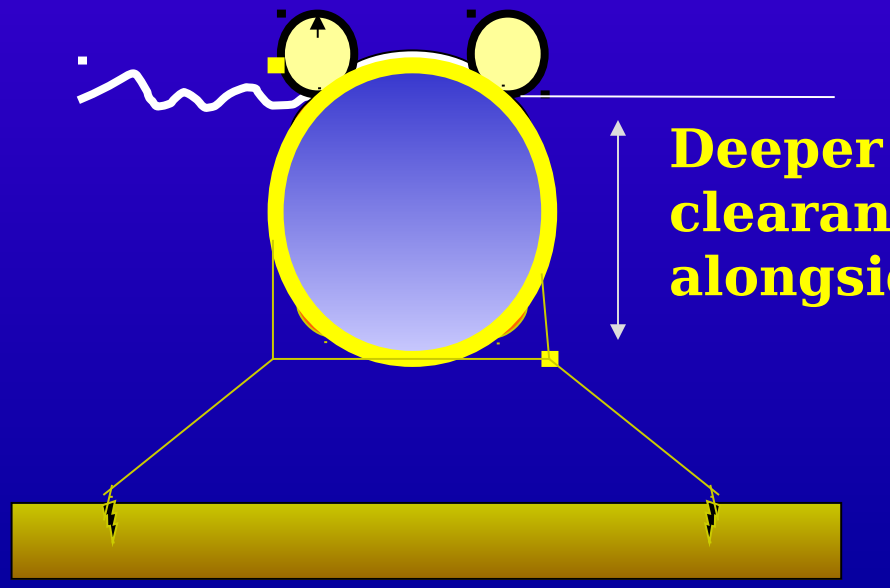
urricane Mooring Syst

- Helical Ancl
- Seaflex
- Spectron

XM 2000 MOORING SYSTEM

- Mooring design worked well
  - Held configuration
  - Steep interior line slope allowed easy access to interior

- 74th Engr Dive Detachment (Ft Eustis) deployed helical anchors
  - Actively seeking the mission of RIB employment
  - Provided estimate of



POTENTIAL OPERATIONAL MOD

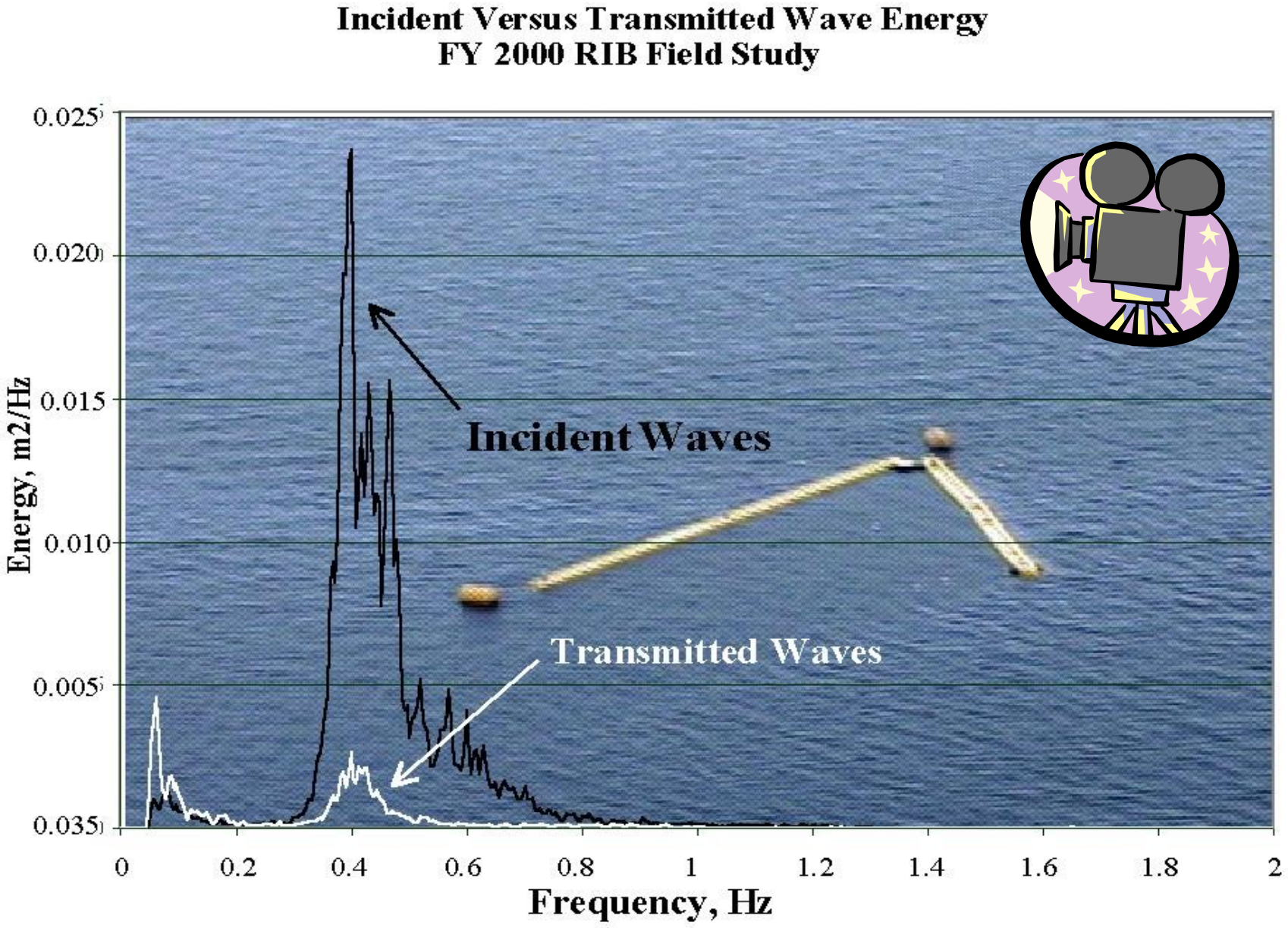
Alongside Option

Check Mark Option

Current-Aligned Option

FREESTREAMING SURVIVAL MODE

Performance ….



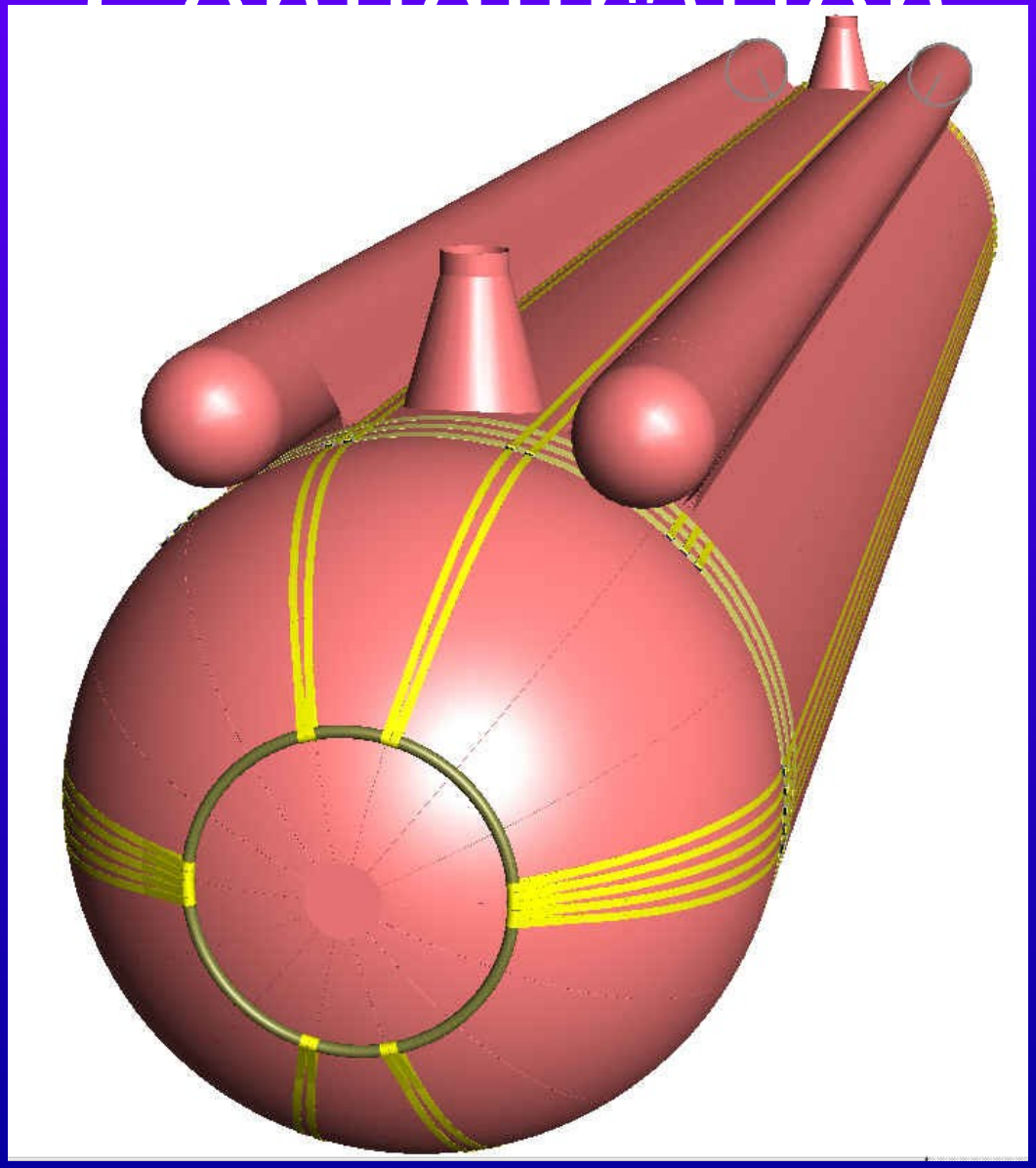
Upcoming & Future Efforts

- FY 01 Field Study – Port Canaveral, FL
  - Single leg with two 200 ft segments
  - Test joint in SS3 & Higher
  - Leased barge employment/recovery
- ATD demo in 2002
  - Exercise participation
  - East Coast USA preferred location
  - Test & Evaluation Community participation

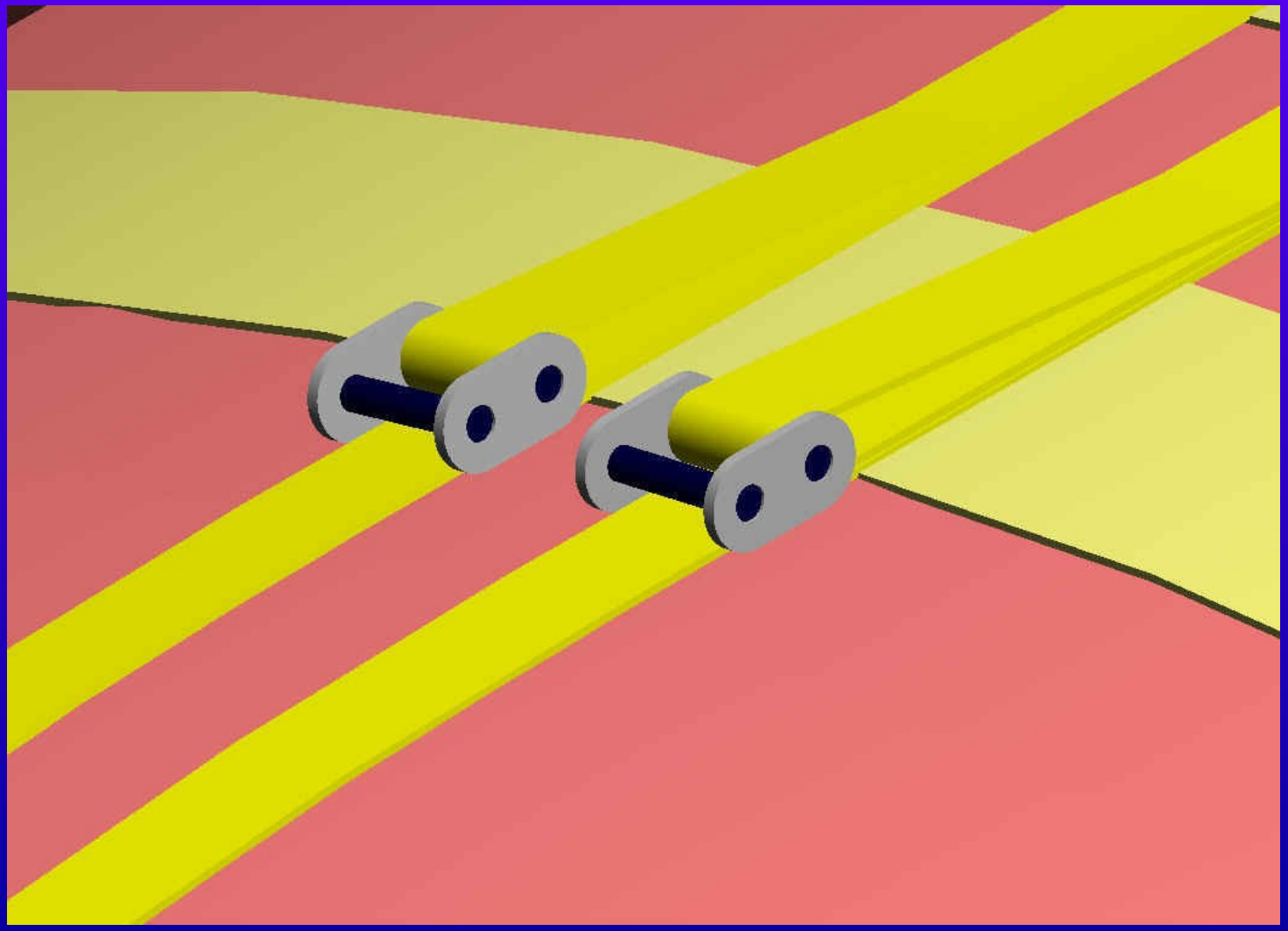
TACOM LEAD

- Selection of Delivery/Employment Vessel
- Operational Issues
- Who deploys/maintains RIB System

FY 01 RIB Configuration



Strap Connections



DELIVERY SYSTEM

&

ACQUISITION STRATEGY

MR. AVERY SOMMERFIELD
TANK-AUTOMOTIVE & ARMAMENTS COMMAND

FY01 ATD DELIVERY SYSTEM

- **Current Plan Is To Use 2 Retired BC 7005 Series Barges.**

- **Barges Currently In Fort Eustis and Baltimore.**

- **Best 2 Barges Will Be Selected.**

- **Barges Will Be Transported By Army Assets (Fort Eustis).**

- **Quantum Engineering To Modify 1 Barge To Deploy/Retrieve RIB.**

- **Barges Required In Cape Canaveral by March 1 For FY01 Test Modifications.**

BC 7005 SERIES BARGE SPECIFICATIONS

- **Length Overall: 120 Feet.**
- **Beam: 33 Feet.**
- **Cargo Capacity: 585 Long Tons.**
- **Draft -- 2.5 Feet (Light); 8 Feet (Loaded).**
- **Displacement --175 Long Tons (Light)/760 Long Tons (Loaded).**

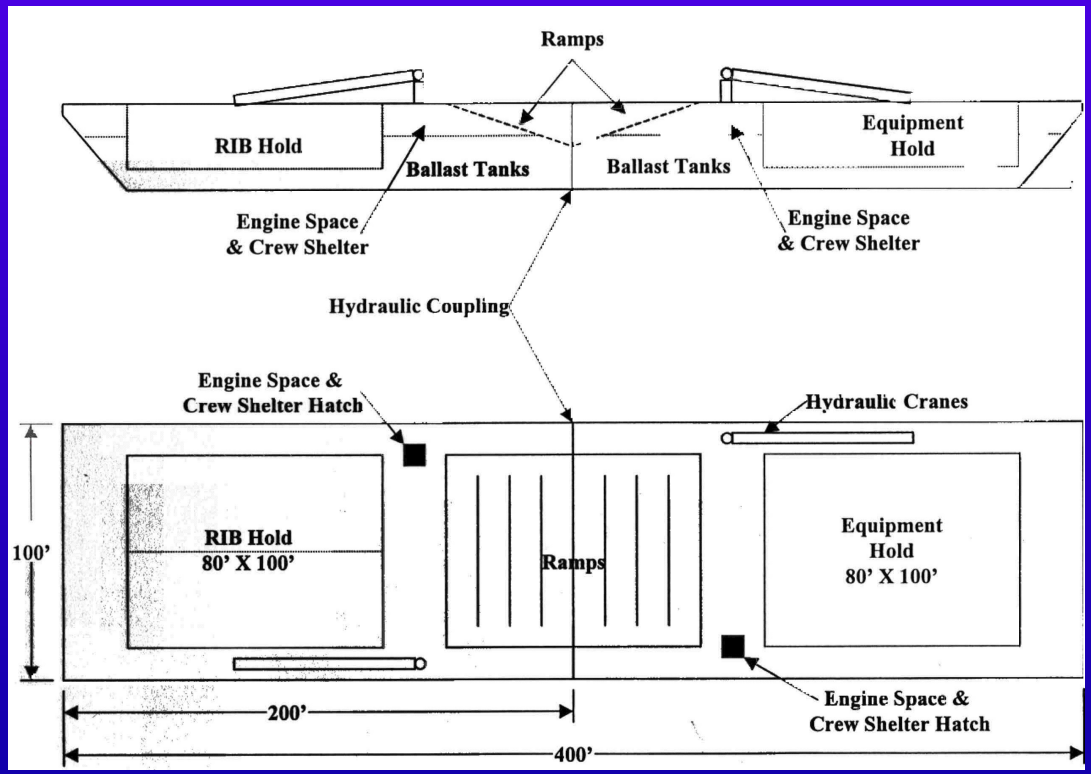
CURRENT DELIVERY CONCEPTS

- **Deployment/Employment Method & Design.**
  - * **Spools.**
  - * **Folded On Deck.**
  - * **Storage Containers -- 40 Foot ISO Containers or Flat Racks.**
  - * **Other**
- **Launch Method & Design.**
  - * **Automatic - Pneumatic, Hydraulic, Electric, Explosive Charges, Etc.**
  - * **Manual Via Soldier Manpower**

Mounted on Spool

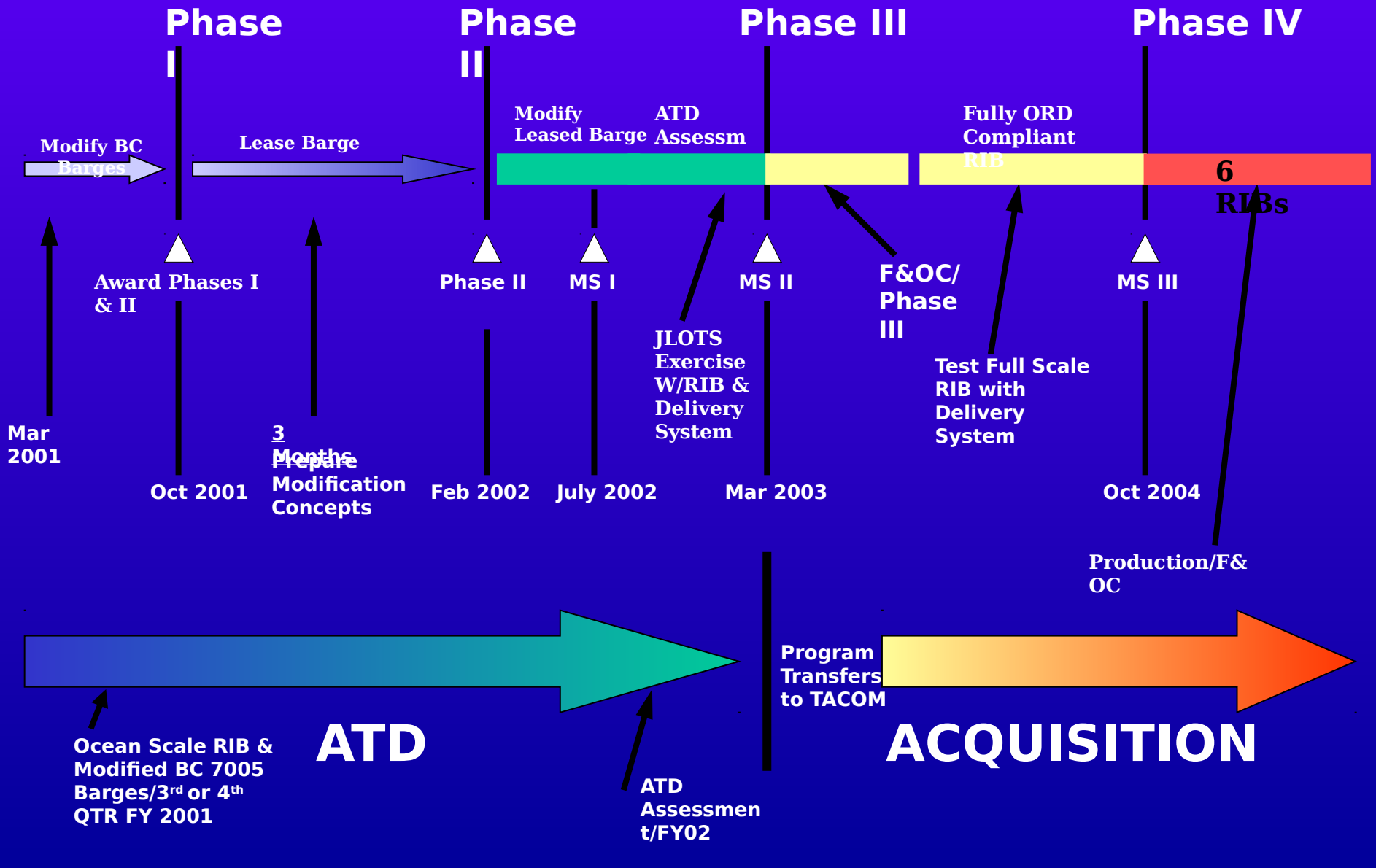
Unfolding RIB

PRODUCTION RIB DEPLOYMENT BARGE CONCEPT



- Barge Can Be Towed By 128 Foot Tug.
- Splits Into 2 RRDFs After Deploying RIB.
- Each RIB Barge Could Replace 2 JMLS or MCS RRDFs.

ACQUISITION STRATEGY



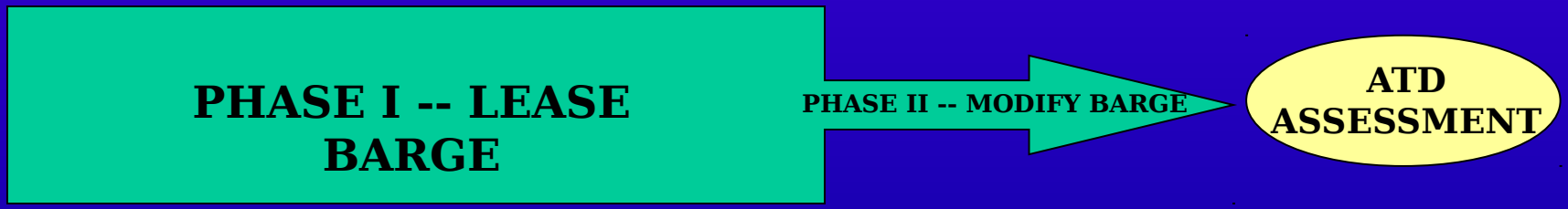
PHASE I

- **Contract Award To Lease Barge for ATD Delivery System:**
  - * **Successful Phase I To Conduct Phase II/Modify Barge.**
  - * **Phase I Full & Open Competition.**
- **Written Proposals Required:**
  - * **Design.**
  - * **Engineering & Fabrication Capabilities.**
  - * **Past Performance.**
  - * **Management Approach.**
- **RFP Scheduled For June 2001 Release.**
  - * **Oral Presentations To Be Used To Evaluate Technical Approach.**
  - * **Contract Award in October 2001 (FY02).**

PHASE II

- **Phase II Completed By Phase I Contractor -- Cost Negotiated.**
- **Modified Barge (Leased) Used During ATD Assessment in 2002 JLOTS Exercise.**

- **Phase II Lessons Learned To Be Applied To EMD Phase.**



- **MS I During Phase II.**

PHASE III

- **Full & Open Competition.**
- **Formal Source Selection Process.**
  - * **Source Selection Authority (SSA) Will Be Appointed.**
  - * **Source Selection Plan To Be Developed.**
- **Engineering & Manufacturing Development (EMD).**
  - * **Build Full Scale RIB.**
  - * **Provide Delivery "System."**
  - * **Conduct First Article Tests (FATs).**
- **Delivered RIB & Delivery "System" To Be**

PHASE IV

- Full & Open Competition.
- Production Contract Award in February 2005.
- Phase IV Contractor To Manufacture 6 Production RIBs & Barges.

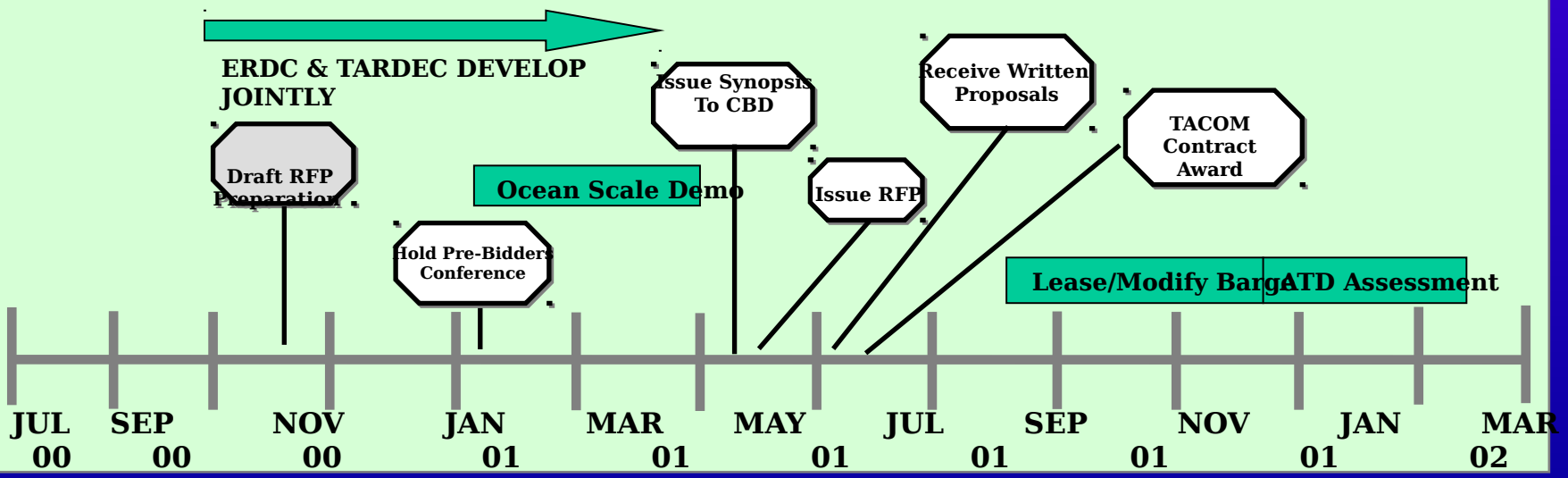
PHASE I SCHEDULE

Objective: Award Contract to Lease and Modify Barge for RIB Delivery System

CURRENT/PLANNED ACTIVITY

- Issue Request For Proposal (RFP): Jun 2001
- Issue Synopsis To CBD Jul 2001
- Issue RFP- Jul 2001
- Deadline For Questions 27 Aug 2001
- Written Proposal Receipt Sep 2001
- Oral Presentations Begin Sep 2001
- Proposal Evaluation Complete: Oct 2001
- Contract Award Oct 2001

KEY EVENT TIMELINE



TOTAL ESTIMATED COST

- **Phases I & II (Lease/Modify Barge(s) -- 1.42M.**
- **Phase III/EMD -- 22.133M**
- **Phase IV/Production -- TBD**

RIBS UNFINANCED REQUIREMENTS

- **FY01-04 R&D:**
  - * **Develop Prototype Delivery System.**
  - * **$22.5M Unfunded.**
- **FY05-10 PRODUCTION:**
  - * **$80.34M Unfunded**
  - * **6 RIBs With Delivery Systems.**

QUESTIONS???????

Force Structure

- **Transportation Causeway Company: TOE Missio**
- **Transportation Floating Craft Company: Direct**
- **Engineer Dive Teams: Direct Support**
- **Transportation FC Maintenance Company: Dire**

RIBS SCHEDULE